

Experimental study of Fault permeability

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To grasp the characteristics of fault seals, the apparatuses which are named HiT/HiP tri-axial compression apparatus and diagenesis effect reproduction device are settled in Technology Research Center, Japan National Oil Corporation. The former one can be set the pressure and temperature on 300MPa, 300 degree Celcius, the latter one is one of the direct shear devices. It can do not only compaction but also shear tests the result of using special seal rings. Both devices can reproduce the stress setting wherever the rocks are there, and can measure the permeability during deformation.

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The HiT/HiP tri-axial compression apparatus have been settled for one year. The specimen for this device is decided pre-cut Berea sandstone and $\phi 40 \times 100$ mm size. During one run, we measure axial load, axial displacement and pore pressure (differential pore pressure) for calculating permeability vs. stress and/or strain. We already get the result that the permeability, storage capacity and diffusivity are change when the stress is dropped. Also, the Pressure ratio (pressure input upperstream/pressure output downstream) will be change drastically even if the clay layer is thin enough. We hope we can get the result the temperature effect on permeability. The Diagenesis effect reproduction device is now making and we will start the experiment from April. We hope we can simulate the permeability change of shear zone at the time of compaction, deformation and uplifting.

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